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by heat, electricity, and chemical action, or even when cross-examined by the spectroscope? Does not gold exhibit an integrity worthy of a noble nature? Does it hold out to alchemy the most distant hint of a multiple nature by means of which she may hope to divide and conquer?

The hypothesis of the evolution of the chemical atoms by aggregation or polymerization of one matter substance challenges scientific thought. Based upon broad assumptions and sustained entirely by analogy, it will hardly disturb the relative coinage value of the metals by holding out hopes of alchemic transmutation. The advice of Mr. Crookes to treat it simply as a provisional hypothesis is conservative and wise.

NOTES AND NEWS.

TO MEET the desire for instruction in the modern branches of astronomy, which have been so wonderfully developed in the last few years, a post-graduate course in astronomy and astro-physics, open to a limited number of students, has been established at the Western University of Pennsylvania. Exceptional facilities for such a course are afforded by the library and apparatus of the Allegheny observatory. Instruction will be given by means of lectures, recitations, and examinations, and by the practical use of instruments in observation and measurement. A knowledge of mathematics equivalent to that given in the undergraduate department of the university is requisite for admission to the course, which will extend over a term of two years. Further information may be had of Dr. W. J. Holland, chancellor of the university, or of Professor J. E. Keeler, director of the Allegheny observatory.

— At Hanover, Penn., a system is used for cooling water, that is both simple and beneficial, according to a description of it in the *Railroad and Engineering Journal*. The town is described as being closely built, and without any system of drainage, so that the water in the wells is unfit to drink. Some years ago these reasons led to the introduction of a supply of very excellent water from a large spring about three miles distant. This water is brought through iron pipes, and when it reaches the consumer in summer is warm, while the water in the wells is cool. For this reason many of the inhabitants drink the well-water, and, as a consequence, typhoid fever is a prevalent disease in that community. In order to obtain pure cool water, not impregnated with lime, some of the inhabitants of the place have adopted a plan which is so simple and gives such excellent results that it is worthy of general adoption wherever there is a water supply other than wells or springs. The plan is as follows. A cylindrical galvanized sheet-iron tank twelve inches in diameter and four or five feet long, is placed in the bottom of a well. The tank is then connected by a galvanized iron pipe with the water-supply pipes, and another pipe is carried from the tank to the surface of the ground, or to any convenient point for drawing water, and has a cock at the upper end. The tank is consequently always filled with water from the water-supply, and being in the bottom of the well, the water is cooled off and acquires the temperature of the well, so that that which is drawn from the tank is as cool as well-water, and is without any of the impurities with which the latter is contaminated. The water drawn from the tank in one of the wells in the place named had a temperature of 56° when the thermometer in the atmosphere above stood 76°. This method gives an abundant supply of cool water during the whole summer, and can be adopted in all cities, towns, or in the country. If a well is available, it can be used; if not, by simply digging a hole in the ground deep enough so as not to be affected by the surface temperature, and burying the tank, it will answer equally well. This hole might be dug in a cellar or outside the building. If the water has any impurities in suspension, such as mud, the tank should be made accessible, so that it can be cleaned separately.

— A writer in the *Illustrated American* says that in work which requires the application of great strength combined with good judgment the elephant is supreme; but as a mere puller and

hauler he is not of great value. In piling logs, for example, the creature soon learns the exact manner of arranging them, and will place them upon each other with a regularity not to be excelled by a human workman. Sir Emerson Tennent, in his work on Ceylon, mentions a pair of elephants who used to raise their wood-piles to a great height by rolling the logs up an inclined plane of sloping beams. The same writer was once riding near Kandy, toward the scene of the massacre of Major Davies' party in 1803. He heard a queer sound in the jungle, like the repetition, in a hoarse and discontented tone, of the ejaculation of "Urmph, urmph!" Presently a tame elephant hove in sight, unaccompanied by any attendant. He was laboring painfully to carry a heavy beam of timber which he balanced across his tusks, but, the pathway being narrow, he had to keep his head bent in a very uncomfortable posture to permit the burden to pass endways, and the exertion and inconvenience combined led him to utter the dissatisfied noise which had frightened the horse. When the creature saw the horse and rider halt, he raised his head, reconnoitered them for a moment, and then he flung down the timber, thoroughly appreciating the situation, and pushed himself backward among the bushwood so as to leave a passage for the horse. But as the horse did not avail itself of the path, the elephant impatiently thrust himself deeper into the jungle, repeating his cry of "Urmph!" but in a voice meant to invite and encourage. Still the horse trembled, and the rider, anxious to observe the instinct of the two intelligent creatures, forbore any interference with them. Again the elephant wedged himself farther in among the trees and waited for the horse to pass, and after the horse had done so timidly and tremblingly, the wise creature stooped, took up his heavy burden, and, balancing it on his tusks, resumed his route, hoarsely snorting his discontented grunt as before.

— Experiments in seeding with different quantities of wheat were begun on the farm belonging to the Ohio State University several years previous to the establishment of the experiment station. These experiments have been continued on the same farm by the station, and the tenth experiment has just been harvested. In this experiment two varieties of wheat were used, Dietz and velvet chaff (Penquite's velvet). The land on which they were sown had borne nine successive crops of wheat, having been dressed three times with barnyard manure during that period. The land occupied by the velvet wheat lies upon a gravel knoll, sloping to the west, the gravel coming in some places to within two or three feet of the surface. The wheat on this knoll has for several seasons been less vigorous than in other parts of the field, and this season especially it was badly infested with the wheat midge, commonly known as the red weevil. The Dietz wheat grew upon land of a little better quality, and sloping to the east instead of the west. It was but slightly injured by insects. While the yields of the velvet are irregular, they do not favor very thin seeding. In the case of the Dietz, however, the results are decisive. Every time the seed falls below four pecks or rises above seven there is a falling off in yield. In the long run, seeding at from five to seven pecks has given a larger harvest than when less or more seed was used.

— The idea of university extension had its first expression at Oxford as far back as 1845. Since then its advance has been constant and of late years very rapid. Though Oxford was the first university to give a form to the wide-spread desire for higher education, it was almost the last to enter upon the practical details of the work. That it now has by far the larger number of extension students is due in great measure to the energy and skill of Michael E. Sadler, secretary to the Oxford Delegacy, who, in the current number of *University Extension*, discusses the future of this movement in England. Other articles show the relation of this work to the common school teacher and to American women. One of the most successful experiments of last season in extension teaching was at Providence in connection with Brown University, and is described in this August issue by Professor Appleton of that faculty. In the department of Notes is an interesting hint as to the natural connection of this movement with the Chautauquan system, so excellently developed by Bishop Vincent and his assistants.